Health Information System Adoption and Customer (Patient) Satisfaction of Selected Private Hospitals in Kogi State, Nigeria

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Abstract
This study examined healthcare information system adoption and customer (patient) satisfaction of selected private hospitals in Kogi State. The specific objectives are to (i) examined the effect of service quality of health information system adoption on customer patronage of selected private hospitals in Kogi State. The study also investigated the effect of system quality of electronic health record adoption on customer loyalty in selected private hospitals in Kogi State. The Study adopted survey research design to study the research objectives. The population of the study comprises of five digitalised hospitals in Kogi State The study adopted Godden model for the infinite (unknown) population of customers (patients). The result of the study showed that there is a significant relationship between service quality of health information system adoption and customer patronage in selected private hospitals in Kogi State with R^2 value of 0.912 and the significance level which is less than 0.005. The second hypothesis showed that there is significant relationship between system quality of electronic health record adoption and customer loyalty of selected private hospitals in Kogi State with the R^2 value of 0.880 and the significance level which is less than 0.005. The study recommended that private health providers must improve on the reliability and accurate of the health information system to avoid time wastage (arrival, waiting and service time) in order to satisfy the customers. There should be adequate provision for automated patient record system, information sharing system, electronic healthcare form system and computerized provider order entry system to attract loyal customers.

Keywords: Health Information System, Customer (Patient) Satisfaction, Service Quality, System Quality, Customer loyalty

Introduction

An expansion in the global competition for the provision of services has created a rigorous situation that influences the inhabited business, particularly medical services. As a result, the health care information system adoption has begun to stress on the superior healthcare service delivery due to the growing competition among hospitals. This delivery has persuaded the patients to make the best choice in selecting any hospital with best modern technologies (Bleustein, et al, 2014). Improved patient care has become a priority for all health care service providers with the optimum objective of achieving a high degree of patient satisfaction (Lee & Yom, 2007). At the same time, good healthcare service delivery, as compared to their counterparts, provides businesses or public trusts with the opportunity to distinguish their facilities in a competitive industry (Karatepe, Yavas & Babakus, 2005).

Satisfaction is one of the key factors pertaining to government policy or a successful business which can only be sustained through the delivery of exquisite service quality resulting in improved satisfaction through the use of healthcare information system. These ameliorated provisions require effective service delivery through the use of healthcare information system, cost allocation, and management strategies (Sun, et al 2017). In the context of suppliers, there are two forms of service providers that are working particularly well in developing countries like Nigeria in private hospitals. Selecting the right health center with sophisticated modern technologies and skilled physician are imperative to fulfil the aim of patient satisfaction as it suggestively influences the treatment of the patient. The patient's opinion is becoming more important in the improvement process of a health care delivery system. It is on this background that this study sought to examine healthcare information system adoption and customer (patient) satisfaction of selected private hospitals in Kogi State.

Healthcare service delivery in Nigerian hospitals has become worrisome over the last decades. Hospitals and clinics in public and private sectors have failed to follow the global trend of information systems or competently implement policies to ensure patient health information are not just properly stored, but retrieved easily for prompt and efficient health service delivery. Health services in Nigeria are characterised by inefficiency and poor management practices, which has become major obstacles to healthcare delivery (Elikwu et al., 2020). Specifically, there is increasing concern over the poor clinical and healthcare services experienced in hospitals and healthcare centres in Kogi State, Nigeria.

Previous studies (Adebowale & Owolabi, 2017) have found that patients are not confident in receiving appropriate treatment in Nigerian hospitals most especially government owned facilities. Some of the factors found to be influencing this perception are explored in several studies. The problem of poor healthcare services may have caused many factors which include the incompetence of the healthcare professionals (Adebowale & Owolabi, 2017), use of obsolete equipment and facilities (Elikwu et al., 2020), scarcity of skilled health professionals and high cost charged when services are available (Brady & Cronin (2001).

Nigeria which is called the giant of Africa has shown a dramatic increase in its population growth (Caha, 2012). Recent reports showed that Nigeria which is Africa's most populous country with an estimated population above 182,202,000 still find it difficult in sustaining the Nigerian healthcare system. The recent outbreak of Coronavirus (COVID 19) disease exposed how ill-equipped the health system is and highlighted the importance of a strong health system (WHO, 2020). Prior studies have shown that the healthcare system in Nigeria has not been able to cater for the rapid population growth and there is little progress towards ensuring the quality of health of the populace (Nwankwo et al., 2010). Meanwhile, despite the emphasis on the use

of technology to enhance the healthcare service delivery, Nigeria's healthcare players have not explored the option to the benefit of the citizens.

Furthermore, how well the private hospitals in Kogi State are adopting health information system is another great concern that called for this study; there are only few studies done on health information system which are mainly from the developed countries and very few in the hospitals context in Nigeria especially for health sector. Therefore, in the light of the foregoing, the following research questions became relevant.

i. To what extent does service quality of health information systems adoption influence patients' patronage in selected private hospitals in Kogi State?
ii. To what extent does system quality of electronic health record adoption influence patients' loyalty in selected private hospitals in Kogi State?

The main objective of the study is to examine the effect of health information system adoption and patients' satisfaction of selected private hospitals in Kogi State. The specific objectives are to:

i. Examine the effect of service quality of health information Systems adoption on customer patronage in selected private hospitals in Kogi State.
ii. To investigate the effect of system quality of electronic Health record adoption on customer loyalty in selected private hospitals in Kogi State

Premised on the specific objectives, the following hypotheses were formulated and tested:
H_{01}: Service quality of health information system adoption does not have significant effect on customer patronage in selected private hospitals in Kogi State
H_{02}: System quality of electronic health record adoption does not have significant effect on customer loyalty in selected private hospitals in Kogi State

Literature Review
Concept of Health Information System
According to Ismaili, (2012) hospital information systems (HIS) are comprehensive, integrated and specialized information systems designed to manage administrative, financial and clinical aspects in the hospitals. The main goal of healthcare information system in hospitals should be to enable easy communication within and outside the hospital, reducing medical errors and cutting coast of the patient's treatment. Furthermore, Almunawar and Anshari (2011) argue that the main goal of a healthcare information systems is to give efficient and high-quality healthcare services and also to promote development, rationalization and improvement of the hospital management. As technology develops and so as do electronic healthcare records become more common, patients and clinicians are working towards a safer, more personal form of health care delivery. The patients are the consumers of the healthcare and are the witness of the paradigm shift (Caligtan & Dykes, 2011).

Electronic Health Records Systems (EHRS)
Electronic health records systems provide a longitudinal view of a patient's medical history over his or her lifetime generated by one or more healthcare providers or medical organizations delivering treatments to that patient (King et al., 2014). According to Latha, Murthy and Sunitha (2012) Electronic Health Records System is an electronic store containing the medical records of the patient. Electronic health is perceived as a general term that denotes any and all types of digital information associated with and important to healthcare delivery. It is the integration of

information supported equipment to aid every aspect of medical care services, literature, research, surveillance, education and knowledge (Umar, 2015). King et al., (2014) asserts that, with the introduction of EHRs has greatly transformed the healthcare industry by providing more services, improving the quality of patient care and enhancing the data access ability in real time, thereby creating a diverse set of health data management systems. The cohesive and summarized records of the patient's record include the demographic and personal information, past and current diagnoses and treatments, progress notes, laboratory and radiology results, allergies, and immunizations.

Service Quality

According to Ovretveit (2009) service quality care is the provision of care that exceeds patient expectations and achieves the highest possible clinical outcomes with the resources available. He developed a system for improving the service quality of healthcare based on three dimensions of quality: i) professional, ii) client, and iii) management quality. Professional quality is based on professionals' views of whether professionally assessed consumer needs have been met using correct techniques and procedures. Client quality is whether or not direct beneficiaries feel they get what they want from the services. Management quality is ensuring that services are delivered in a resource-efficient way.

System Quality

System quality is a user's experience of the system from a technical, design and operational perspective. This is reflected in a user's evaluation of system attributes such as ease of use, reliability and response time. These attributes have been found important to healthcare IT acceptance in a number of contexts. Slow response time and difficulties in HIS use can result in severe dissatisfaction and eventually lead to the shutdown of an HIS system (Cohen, Coleman, et al., 2016). System quality is concerned with the system features of health IT. System quality that is potentially contributed to patient safety incidents is denoted in terms of usability, compatibility, reliability, and response time (Salahuddin & Ismail, 2015).

Patient Loyalty

According to Blizzard, (2005) patient loyalty is a patient's likelihood to return to a healthcare facility. When a patient feels that the performance of a service is worse than expected, they feel dissatisfied. Consumer loyalty is a deeply held commitment to rebuy or repatronize a preferred product or service consistently in the future, causing repetitive same-brand or same-brand-set purchasing, despite the potential for situational influences and marketing efforts to cause switching behavior It consists of four loyalty phases: cognitive, affective, conative and action. Conative loyalty, also called behavioural intention, implies a brand-specific commitment to repurchase (Wei-Jiao et al, 2017)

Patient Patronage

Patronage refers to impulses, desire, and consideration within the consumer which induce the purchase of goods and services from certain outlets or company (Ozor, 2002). Patient patronage therefore, is the approval or support provided by patients with respect to a particular health centre or hospital. It also means the act of being a regular customer to a health centre or hospital (Grewal & Levy, 2010). In a highly competitive industry such as healthcare, satisfying customers (patients) should be the primary focus of firms that which to sustain patronage (John & Tyas, 1996; Sulek & Hensley, 2004). Positive evaluations result in patronage, and loyalty (Grewal & Levy, 2010)

Figure 1: Conceptual Framework
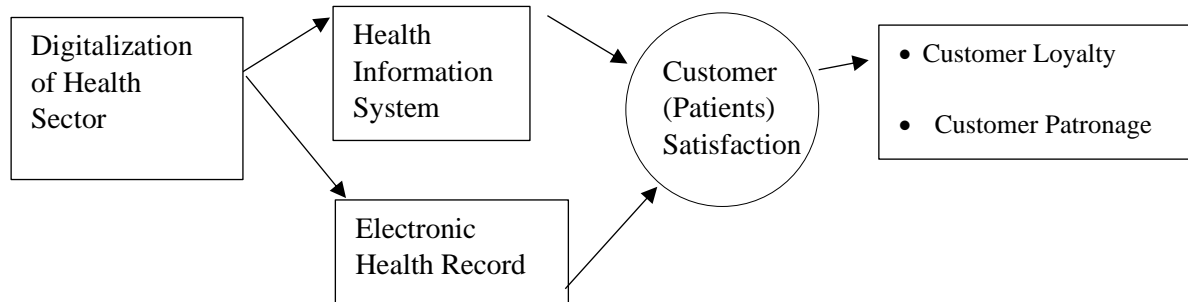
Source: Authors' Conceptualization, (2023)

Theoretical Reviews
SERVQUAL Model

Measuring service quality is more complex in comparison to product quality as a result of specific elements peculiar to services such as intangibility, inseparability, heterogeneity and perishability (Chang & Yeh, 2002). Hence, as a result of the development of services within the past years, several researchers have realized the necessity to develop measures of service quality. SERVQUAL model is widely used to examine external service quality. Nevertheless, the model can also be changed to examine the quality of the internal services offered by departments and divisions of a firm to her staff in other departments and divisions. The SERVQUAL model has remained a widespread method used in measuring consumers' perceptions of service quality.

Below are the five generic dimensions or elements of SERVQUAL model (Van Iwaarden *et al*., 2003):
  i.   Tangibles: this is the physical facilities, equipment and appearance of employees in the organization.
  ii. Reliability: it is the capability of a firm to execute the assured service in a dependable and precise way.
  iii. Responsiveness: this is the readiness of the employee in the organization to assist customers and offer timely service.
  iv. Assurance: this comprises of proficiency, courteousness, integrity and security, knowledge and courteousness of personnel and their capability to infuse trust and confidence in the mind of the customers.
  v.   Empathy: this refers to the accessibility, communication, understanding the customer and the Care and personalize attention that the company offers its customers.

Information System Success Model (D & M model of IS success)

The information system success model was first propounded in 1992 and updated in the year 2003 by DeLone and McLean (D&M). It was the most popular and most validated model in the information systems fields. The model has six interrelated dimensions for better succession of information systems. The study adopts information system success model. This model gives a clear content issues and characteristics of the information systems output in terms of timeliness, accuracy, reliability and trustworthiness of the hospital information system that are in use. They further expressed that service quality in hospital systems are measured in terms of quality support rendered by the information system's developer and this can be assessed through the service quality dimensions, such as assurance and responsiveness of the systems supported and the provision of user training respectively.

Empirical Studies

Elikwu et al., (2020) investigated how electronic health information system can improve medical records management in Nigeria's public healthcare institutions. The study employed the numerical and qualitative research philosophy, adopted the survey and case study research strategies, the cross-sectional and qualitative research designs. The study sample covered 332 respondents spread across four selected Federal Medical Centres in Makurdi, Keffi, Lokoja and Abuja FCT, all located in the North Central Region of Nigeria. The study used the simple frequency percentage table to analyse collected data. The finding revealed that, though there is still heavy reliance on traditional paper-based records system, however, adoption of eHIS will reduce risk of treatment errors, decrease patient waiting time, enhance timely communication among practitioners, protects patient information from unauthorised personnel and enhance healthcare service delivery.

Bethwel (2019) carried out a study on implementation of hospital management information systems on service delivery: a case of teaching and referral hospital in Kenya. Descriptive cross section- study design was adopted in the study with quantitative and qualitative approach. The data collected was encoded and entered into SPSS v25 a computerized data analysis software, Each dimension had various items measured on a 5-point Likert scale. The relationship between the independent variables and dependent variables was determined through Regressions and Analysis of Variance (ANOVA). The study revealed Stakeholders play a critical role and may jeopardize the success of the system, involving the critical stakeholders' works as a motivating factor, which works towards availing more resources. A positive and significant effect of HMIS on service delivery. It can therefore be concluded that implementation of HMIS, utilization of HMIS, strategies motivating use of HMIS, and benefits of HMIS are key in improving service delivery in MTRH.

Adebowale et al., (2017) assessed the relationship between perceived service quality of health information management personnel and patient satisfaction in selected tertiary hospitals in Nigeria. A cross sectional survey was conducted with 280 patients from three tertiary hospitals in a Nigerian State. A self-administered questionnaire was distributed to outpatients who were literate, willing and attending the clinics for at least a second time. Perceived service quality was measured using a modified version of Service Quality (SERVQUAL) scale. Patient satisfaction was measured on a 4-point Likert-type scale developed by the researchers. Collected data were subjected to statistical analysis using mean, standard deviation and regression analysis. The surveyed patients were moderately satisfied with the services of the health information management personnel. Accordingly, patients' perception of the health information management personnel service quality was found to be average. In addition, the research has shown that patients' perception of health information management personnel service quality significantly influences their level of satisfaction in the studied tertiary hospitals ($R = .62$, $F5, 274 = 35.95$, $p = .000$). Patient perceptions of service quality determine their overall satisfaction levels with the health information management personnel services. The tangible service quality dimension had more influence on patients' satisfaction.

Jin et al. (2016), studied the users' adoption of healthcare information: An empirical study of an online Q&A community. The objective of the study was to explore patients' healthcare information seeking behavior in online communities. The research method was based on dual-process theory and the knowledge adoption model. The model highlights that information quality, emotional support, and source credibility are antecedent variables of adoption likelihood of healthcare information, and competition among repliers and involvement of recipients moderate the relationship between the antecedent variables and adoption likelihood.

The research results were Information quality, emotional support, and source credibility have significant and positive impact on healthcare information adoption likelihood, and among these factors, information quality has the biggest impact on a patient's adoption decision. In addition, competition among repliers and involvement of recipients were tested as moderating effects between these antecedent factors and the adoption likelihood. Results indicated competition among repliers positively moderates the relationship between source credibility and adoption likelihood, and recipients" involvement positively moderates the relationship between information quality, source credibility, and adoption decision. In addition to information quality and source credibility, emotional support has significant positive impact on individuals" healthcare information adoption decisions. Moreover, the relationships between information quality, source credibility, emotional support, and adoption decision are moderated by competition among repliers and involvement of recipients.

Shah and Peikari (2016), carried out a study on electronic Prescribing Usability: Reduction of Mental Workload and Prescribing Errors among Community Physicians. The research was to address three gaps in this field. First, the factors leading to the reduction of mental workload and its relationship with the reduction of prescribing errors by improving electronic prescribing (e-prescribing) usability have not been empirically examined before. Second, the past research in the field of e-prescribing usability lacks robust theoretical models. Third, there are no existing studies to examine the direct influences of user interface consistency and error prevention with the reduction of mental workload and prescribing errors. The research variables considered are: Information Quality, Ease of Use, Error Prevention, Consistency, Reduction of Mental Workload and Reduction of Errors. Quantitative survey method was used to collect data from 188 community physicians. The partial least squares path modeling technique was applied to analyze the data. The study found out that prescribing errors were reduced by improving the information quality, user interface consistency, system ease of use, and mental workload reduction. Mental workload is reduced by ease of use, error prevention, and consistency. No significant relationships between prescribing error reduction with error prevention and also between information quality with mental workload reduction were found.

Peikari, (2015) researched on the impacts of second-generation e-prescribing usability on community pharmacists' outcomes. The study was to investigate the extent to which second generation e-prescribing usability leads to positive outcomes for community pharmacists. The study considered a robust and rigorous quantitative research method and multivariate data analysis to examine the extent to which second generation e-prescribing usability improves the positive outcomes (including the improvement of communication, facilitation of providing care, reduction of medical errors and workload) amongst community pharmacists. A quantitative survey research method was used and the data was collected from the community pharmacists, who use an e-prescribing system. Data from 152 questionnaires collected in a national survey were used to for the study. Partial Least Squares (PLS) path modeling was used to examine scale reliability, validity and hypotheses. The result showed that, the scale was found to test well for reliability and validity. Examining the hypotheses illustrated that ease of use ($P < 0.01$, $t = 5.79$) and information quality ($P < 0.01$, $t = 6.24$) of an e-prescribing system improved pharmacists" outcomes (including communication, facilitation of care, reduction of workload and medical errors) while ease of use of the system was influenced by user interface consistency ($P < 0.01$, $t = 7.35$) and system error prevention ($P < 0.01$, $t = 5.29$). Conclusion: To improve community pharmacists' outcomes and practices, the ease of use, information quality, consistency and error prevention features of e-prescribing systems should be improved.

Methodology

This study adopted survey research design to study the research objectives. The study was conducted with the aim of determining the effect of health information system adoption on customer satisfaction of selected private hospitals in Kogi State. The population of the study comprised infinite number of customers from five selected digitalised private hospitals in Kogi State which are all located in the State Capital (Lokoja). The selected private hospitals are: Confluence City Clinical and Maternity, Helping Hand Women Specialist Hospital, Milot Hospitals India RepreEntative, Mount Gerizim Medical Centre, and Niger Hospital. Using Godden model for the infinite (unknown) population is given as:

$SS = [Z^2 p (1-p)]$

Where,

SS = Sample Size

Z = Given Z value   (2.58)

P = Percentage of population (0.05)

C = Confidence Level (0.0

SS =

Therefore, the sample size of 316 respondents were selected for the study. Simple random sampling technique was used to select the respondents. Data were collected through structured questionnaire.

Model Specification

Hypothesis 1 (H_{01}): Service quality of health information system adoption does not have significant effect on customer patronage in selected private hospitals in Kogi State

.... (1)

CP = Customers' Patronage

REL = Reliability

ASS = Assurance

TAN = Tangibles

EMP = Empathy

RES = Responsiveness

μ = the stochastic error term of the model

 = the constant term and intercept of the model

 = the coefficient values of Reliability, Assurance, Tangibles, Empathy, and Responsiveness respectively.

Subscript i in the model indicates that all variables are observed over individuals.

Model for Hypothesis 2

Regression Analysis

The mathematical model that describes how system quality of electronic health records affects customer loyalty of selected private hospitals is given in equation 1 below:

CL = f (SQEHR) …………………………………………………………….

Given that EHR = APR + ISS + CPO + EPF

Therefore,

CL .... (1)

Where:

CL is Customer Loyalty

EHR is Electronic Health Records

APR is Automated Patient Records

ISS is Information Sharing System

CPO is Computerised Provider Order Entry
EPF is Electronic Patient Form
μ is the stochastic error term of the model
 is the constant term and intercept of the model
 are the coefficient values of Electronic Health Records, Automated Patient Records, Information Sharing System, Computerised Provider Order Entry, Electronic Patient Form respectively.

Results and Discussions
Test of Hypothesis One
H01: Service quality of health information system adoption does not have significant effect on customer patronage in selected private hospitals in Kogi State

Table 2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.955[a]	.912	.911	1.50898

a. Predictors: (Constant), TAN, ASS, EMP, REL, RES

Source: Author's Computation, 2022.

The R value of 0.955 in table 2 shows that there exist a strong and positive relationship between Service quality of health information system (Reliability, Assurance, Tangibles, Empathy, and Responsiveness) and customer patronage. The R^2 value of 0.912 implies that the Service quality of health information system contribute about 91.2% to customer patronage, while remaining 8.8% is due to other variables other than the variables in the model. The implication of this is that private health providers must improve reliability, empathy and responsiveness of services by ensuring service delivery adheres to the service charter requirements and continual identification of customer (patients)' needs for improved patient satisfaction and patronage.

Table 3

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6593.108	5	1318.622	579.097	.000[b]
	Residual	633.015	278	2.277		
	Total	7226.123	283			

a. Dependent Variable: CP
b. Predictors: (Constant), TAN, ASS, EMP, REL, RES

Source: Author's Computation, 2022

Table 3 presents the analysis of variance (ANOVA) for the model. F-statistic is shown with value 579.097 and probability value 0.000 indicating that the reported F-statistic is significant, which implies that the model is fit.

Table 4

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21.578	1.236		17.453	.000
	REL	.193	.014	.390	14.261	.000
	ASS	.059	.013	.120	4.385	.000
	RES	.160	.014	.322	11.688	.000
	EMP	.158	.013	.322	11.995	.000
	TAN	.177	.009	.358	19.151	.000

a. Dependent Variable: CP
Source: Author's Computation, 2022

Table 4 presents the coefficients of the service quality of health information system adoption and customer patronage. The overall significance level shows a p-value of 0.000 which is lower than the chosen p-value of 0.05 significance level. This implies that there is a significant relationship between service quality of health information system adoption and customer patronage. Therefore, the null hypothesis was rejected and the alternative hypothesis accepted. More also, the table 4 shows that the result of T-statitistics of service reliability 14.261, assurance 4.385, responsiveness 11.688, empathy 11.995 and tangibility 19.151 and the corresponding significant level of 0.000 which is significant at 5% which also indicates that service reliability, assurance responsiveness, empathy and tangibility have significant effect on customer patronage in private hospitals.

Test of Hypothesis Two

H02: System quality of electronic health record adoption does not have significant effect on customer loyalty in selected private hospitals in Kogi State

Table 5

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.938[a]	.880	.877	1.95881

a. Predictors: (Constant), CPOE, HISS, APR, EHCF
Source: Author's Computation, 2022

The R value of 0.938 in table 5 shows that there exist a strong and positive relationship between System quality of electronic health record adoption and customer loyalty. The R^2 value of 0.880 implies that the System quality of electronic health record adoption contributes about 88.0% to customer loyalty, while remaining 12.0% is due to other variables other than the variables in the model. The implication of this is that private hospitals that have automated patient records, information sharing system, computerised provider order entry, electronic patient form will reduce the waiting time of the customers and increase customer loyalty.

Table 6

ANOVAᵃ						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7792.084	4	1558.417	406.160	.000ᵇ
	Residual	1066.674	278	3.837		
	Total	8858.758	283			

a. Dependent Variable: CL
b. Predictors: (Constant), CPOE, HISS, APR, EHCF

Source: Author's Computation, 2022

Table 6 presents the analysis of variance (ANOVA) for the model. F-statistic is shown with value 406.160 and probability value 0.000 indicating that the reported F-statistic is significant, which implies that the model is fit for the achievement of the overall objective.

Table 7

Coefficientsᵃ						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.639	1.996		6.834	.000
	APR	.186	.023	.338	8.049	.000
	HISS	.223	.018	.407	12.184	.000
	EHCF	.277	.020	.505	13.827	.000
	CPOE	.186	.020	.340	9.238	.000

a. Dependent Variable: CL

Source: Author's Computation, 2022

Table 7 presents the coefficients of the System quality of electronic health record adoption and customer loyalty. The overall significance level shows a p-value of 0.000 which is lower than the chosen p-value of 0.05 significance level. This implies that there is a significant relationship between system quality of electronic health record adoption and customer loyalty. Therefore, the null hypothesis was rejected and the alternative hypothesis accepted. More also, the table 7 shows that the result of T-statitistics of automated patient records 8.049 at 0.000 significance level, information sharing system 12.184 at 0.000 significance level , computerised provider order entry 13.827 at 0.000 significance level, electronic patient form 9.238 at 0.000 significance level which also indicates that automated patient records, information sharing system, computerised provider order entry, electronic patient form have significant effect on customer loyalty in private hospitals.

Discussion of Findings

From the analysis of the first hypothesis, effect of service quality of health information system adoption on customer patronage. The result showed that health providers must keep and improve on reliability and accuracy of the health records of patents, staff must show much empathy by identifying the specific needs of the patients by giving prompt attention, patents

are assured that their records are secured, intact and accessible on request. There must be quick response to patients' needs on arrival and the waiting time for admission must be short. The hospitals have to maintain modern equipment and physical facilities that are visually appealing and pleasant to patients to patronize them. The system will encourage customers (patients) to recommend others to the service provider and continue using the service provider. This is in consonance with Adebowale et al., (2017) which assessed the relationship between perceived service quality of health information management personnel and patient satisfaction in selected tertiary hospitals in Nigeria.

Also, the analysis of the second hypothesis effect of system quality of electronic health record adoption on customer loyalty shows that the use of automated patient records helps to reduce cost of purchasing card in the hospital. Hospital information sharing system helps to transfer patients' data from one unit to another for clinical test without stressing patient or wasting their time on queue. Electronic healthcare forms helps to have paperless patient registration which will be in hospital archive for subsequent patient patronage and usage. Computerised provider order entry for patients helps to get medication, laboratory, and radiology orders to pharmacies, laboratories, and radiology facilities. The systems will encourage the customers (patients) to have a positive attitude towards service providers, and use only the provider when a need for the service arises.

This finding is in agreement with the studies of Elikwu et al., (2020) which established that adoption of electronic record management system will reduce risk of treatment errors, decrease patient waiting time, enhance timely communication among practitioners, protects patient information from unauthorised personnel and enhance healthcare service delivery. The finding is also in alignment with the study of Shah and Peikari (2016) which found out that prescribing errors were reduced by improving the information quality, user interface consistency, system ease of use, and mental workload reduction, mental workload is reduced by ease of use, error prevention, and consistency.

Conclusion and Recommendations

Based on the findings, it was concluded that service quality of health information system adoption has significant effect on customer patronage of the selected private hospital in Kogi State. It was concluded that for any hospital to survive in this era, health providers must keep and improve on reliability and accuracy of the health records of patents, staff must show much empathy by identifying the specific needs of the patients by giving prompt attention, patents must be assured that their records are secured, intact and accessible on request. There must be quick response to patients' needs on arrival and the waiting time for admission must be short. The hospitals have to maintain modern equipment and physical facilities that are visually appealing and pleasant to patients to patronize them.

The study concludes that system quality of electronic health record adoption has significant effect on customer loyalty. Hospitals must have automated patient records which will help to reduce cost of purchasing card in the hospital. They must have hospital information sharing system which helps to transfer patients' data from one unit to another for clinical test without stressing patient or wasting their time on queue. They must also be equipped with electronic healthcare forms which helps to have paperless patient registration. They must have computerised provider order entry which helps patients to get medication, laboratory, and radiology orders to pharmacies, laboratories, and radiology facilities.

Based on the findings of the study, the following recommendations are made:

i. For health providers to remain competitive and satisfy customer (patients) needs, they should improve on reliability and accuracy of the health records of patents electronically. There must be quick response to patients' needs on arrival and the waiting time for admission must be short. Technological factors such as service quality, information quality, system quality, output quality should be considered by healthcare facilities in order to satisfy customers.

ii. There should be adequate provision for automated patient records system, hospital information sharing system, electronic healthcare forms system, and computerised provider order entry system. Users of the electronic health record should also be trained on how to troubleshoot problems encountered with the use of EHR, in case the IT personnel or service support staff are not available in order to attend to customers' needs.

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